

CLAIMS

What is claimed is:

1. An extreme ultraviolet (EUV) lithography mask blank, comprising:
a substrate having an upper surface, a lower surface and a edge surface
5 connecting the upper surface and the lower surface; and
a reflector film disposed over the upper surface and at least a portion of
the edge surface such that a region of the reflector film disposed on the edge
surface is non-planar with an upper surface of a region of the reflector film
disposed on the upper surface of the substrate.
- 10 2. The EUV lithography mask blank according to claim 1, wherein the
region of the reflector film disposed on the edge surface is adapted to receive a
mechanical ground connection.
3. The EUV lithography mask blank according to claim 1, further
comprising a conductive layer disposed on the lower surface of the substrate.
- 15 4. The EUV lithography mask blank according to claim 3, wherein the
reflector film and the conductive layer contact each other adjacent the edge
surface.
5. The EUV lithography mask blank according to claim 4, wherein the
conductive layer is adapted to receive a mechanical ground connection.
- 20 6. The EUV lithography mask blank according to claim 3, wherein the
region of the reflector film disposed on the edge surface is adapted to receive a
mechanical ground connection.
7. The EUV lithography mask blank according to claim 1, wherein the
reflector film includes a plurality of alternative high-Z and low-Z layers.

8. The EUV lithography mask blank according to claim 1, wherein the region of the reflector film disposed on the edge surface and the region of the reflector film disposed on the upper surface of the substrate are integrally formed during the same process operation.

5 9. The EUV lithography mask blank according to claim 1, further comprising a plurality of absorbers disposed over the region of the reflector film disposed over the upper surface of the substrate, the absorbers having a pattern to generate an EUV energy pattern when EUV energy is directed towards the mask blank.

10 10. The EUV lithography mask blank according to claim 1, wherein the region of the reflector film disposed over the upper surface of the substrate is patterned to generate an EUV energy pattern when EUV energy is directed towards the mask blank.

15 11. The EUV lithography mask blank according to claim 1, wherein the edge surface is planar and angled so as to form complementary angles with the upper surface and the lower surface of the substrate.

12. The EUV lithography mask blank according to claim 1, wherein the edge surface is curved.

20 13. An extreme ultraviolet (EUV) lithography mask blank, comprising:
a substrate having an upper surface and a lower surface;
a reflector film disposed over the upper surface of the substrate;
a backside conductive layer disposed on the lower surface of the substrate; and

a means to electrically couple the conductive layer and the reflector film.

25 14. The EUV lithography mask blank according to claim 13, wherein the coupling means includes a front side conductive layer disposed between the

reflector film and the substrate, the front side conductive layer and the backside conductive layer being electrically connected.

15. The EUV lithography mask blank according to claim 14, wherein the front side conductive layer functions as a ground plane for the reflector film when the backside conductive layer is mechanically connected to a ground potential.

16. The EUV lithography mask blank according to claim 13, wherein the coupling means includes a section of the substrate that has been impregnated to establish a conductive path from the backside conductive layer to the reflector film through the impregnated section of the substrate.

17. The EUV lithography mask blank according to claim 16, wherein the impregnated section of the substrate has a thickness that is less than a thickness of a region of the substrate designated for the transmission of patterned EUV energy.

18. The EUV lithography mask blank according to claim 13, wherein the coupling means include a conductive plug disposed in a hole defined by the substrate such that the conductive plug establishes a conductive path from the backside conductive layer to the reflector film.

19. The EUV lithography mask blank according to claim 13, wherein the conductive layer is adapted to receive a mechanical ground connection.

20. The EUV lithography mask blank according to claim 13, further comprising a plurality of absorbers disposed over the reflector film, the absorbers having a pattern to generate an EUV energy pattern when EUV energy is directed towards the mask blank.